

Section III

State Implementation

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3.1 Comparing LT1, IESWTR and the SWTR

The LT1ESWTR builds upon the framework established by the Interim Enhanced Surface Water Treatment Rule (IESWTR- subpart P); many of the two rules' provisions are identical. In turn, both rules supplement the requirements of the Surface Water Treatment Rule (subpart H), by modifying some provisions. Although LT1ESWTR and IESWTR are similar, they target different population categories and there are some other differences between the two which affect system and State responsibilities.

State staff dealing with all three of the surface water treatment rules may want to know how the rules complement each other and the areas that differ. Knowing the differences will enhance the effectiveness of technical assistance, record review, follow-up, and enforcement issues. Table 3.1 provides an overview of sections of the three rules which have comparable, but not identical, provisions. Comparisons are also included as a footnote at the end of the table for the new DBP MCL, disinfectant MRDL and related monitoring requirement provisions of the Stage 1 DBP Rule (subpart L).

Table 3.1: Comparison of Provisions of the SWTR, IESWTR and LT1ESWTR

Subject	SWTR	IESWTR	LT1ESWTR
General Requirements and Compliance Dates	<p>Subpart H - Filtration and Disinfection</p> <p>Applicable to all public water systems using surface water or ground water under the direct influence of surface water (subpart H systems).</p> <p>Systems must comply beginning December 30, 1991.</p> <p>[§141.70]</p>	<p>Subpart P - Enhanced Filtration and Disinfection.</p> <p>Applicable to subpart H systems serving at least 10,000 people and are in addition to the requirements of subpart H.</p> <p>Systems must comply beginning January 1, 2002, unless otherwise specified.</p> <p>[§141.170]</p>	<p>Subpart T - Enhanced Filtration and Disinfection - Systems Serving Fewer Than 10,000 People.</p> <p>Applicable to subpart H systems serving fewer than 10,000 people and are in addition to requirements of subpart H.</p> <p>Systems must comply beginning January 14, 2005, unless otherwise specified.</p> <p>[§141.500]</p>
Watershed Control Requirements to Avoid Filtration	<p>Criteria address <i>Giardia</i>, HPC, <i>Legionella</i> and viruses.</p> <p>[§141.71]</p>	<p>Watershed control programs for unfiltered systems must include provisions for minimizing the potential for contamination by <i>Cryptosporidium</i>.</p> <p>[§141.171]</p>	<p>Same requirements as IESWTR</p> <p>[§§141.520-522]</p>

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Subject	SWTR	IESWTR	LT1ESWTR
<p>Combined Filter Effluent Turbidity Provisions -</p> <p>Diatomaceous Earth Filtration</p>	<p>System's filtered water must be less than or equal to 1 NTU in at least 95 percent of the samples taken each month. At no time must turbidity exceed 5 NTU.</p> <p>Measurements are recorded at least every 4 hours. The State may reduce this frequency.</p> <p>§141.73(c)</p>	<p>No new requirements</p> <p>No individual filter turbidity provisions.</p> <p>No new frequency provisions.</p>	<p>No new requirements</p> <p>No individual filter turbidity provisions.</p> <p>No new frequency provisions.</p>

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Subject	SWTR	IESWTR	LT1ESWTR
<p>Combined Filter Effluent Turbidity Provisions -</p> <p>Alternative Filtration Technologies</p>	<p>Turbidity limits for slow sand filters apply once the system has demonstrated to the State the technology meets the 99.9 percent <i>Giardia</i> removal and/or inactivation and 99.99 percent virus removal and/or inactivation.</p> <p>Measurements are recorded at least every 4 hours. The State may reduce this frequency to once per day.</p> <p>[§141.73(d)]</p>	<p>The State determines the combined filter effluent requirement value that must be met in 95 percent of the measurements taken each month, and a value that may not be exceeded at any time.</p> <p>These values are to be based on a performance demonstration or other means to show consistent achievement of 99 percent removal and/or inactivation of <i>Cryptosporidium</i>, in addition to the removal and/or inactivation requirements for <i>Giardia</i> and viruses specified in subpart H.</p> <p>No new frequency provisions.</p> <p>[§141.173(b)]</p>	<p>As for IESWTR, but the rule specifies the 95th percentile value cannot exceed 1 NTU.</p> <p>As for IESWTR, but the rule specifies the State-determined maximum combined filter effluent value cannot be greater than 5 NTU.</p> <p>No new frequency provisions.</p> <p>[§141.551]</p>

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Subject	SWTR	IESWTR	LT1ESWTR
Individual Filter Effluent (IFE) Turbidity Provisions - Conventional or Direct Filtration Treatment Only	Not applicable	Systems must continuously monitor individual filter effluent turbidity and record the values at least every 15 minutes. If turbidity monitoring equipment fails, grab sampling every four hours may be performed, but for not more than <i>5 working days</i> . [§141.174]	If the system has two or fewer filters, continuous monitoring of the combined filter effluent may be performed in lieu of individual filter effluent monitoring. Systems are allowed to grab sample for not more than <i>14 days</i> . [§§141.560-562]
IFE Follow-up Action - If the turbidity of an individual filter ¹ exceeds 1.0 NTU in 2 consecutive recordings 15 minutes apart	Not applicable	The system must report the date(s), filter number, and turbidity value by the 10 th of the next month. The system must also either produce a filter profile for the filter within 7 days and report that it has been produced, or report the obvious reason for the exceedance if the profile is not performed.	Reporting as for IESWTR, <i>and</i> the system must report the cause of the turbidity exceedance, if known A filter profile is <i>not</i> required. [§141.563]

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Subject	SWTR	IESWTR	LT1ESWTR
<p>IFE Follow-up Action -</p> <p>If the turbidity of an individual filter¹ exceeds 0.5 NTU in two consecutive measurements taken 15 minutes apart at the end of the first four hours of continuous filter operation after the filter has been backwashed or otherwise taken off line...</p>	<p>Not applicable</p>	<p>The system must report the filter number, turbidity and dates(s) in which the exceedance occurred. The system must also either produce a filter profile within 7 days and report that it has been produced, or report the obvious reason for the exceedance if the profile is not performed.</p>	<p>No requirement.</p>
<p>IFE Follow-up Action -</p> <p>If the turbidity of an individual filter¹ exceeds 1.0 NTU in 2 consecutive recordings 15 minutes apart for 3 months in a row</p>	<p>Not applicable</p>	<p>The system must report the filter number, turbidity and dates(s) on which the exceedance occurred.</p> <p>The system must conduct a self-assessment of the filter within 14 days and report that it was conducted.</p>	<p>As for IESWTR, <i>and</i> the self-assessment must be on both filters if CFE is used in lieu of individual filter turbidity monitoring.</p> <p>The system must report the date that it was triggered and the date that it was completed.</p> <p>[§141.563]</p>

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Subject	SWTR	IESWTR	LT1ESWTR
<p>IFE Follow-up Action -</p> <p>If the turbidity of an individual filter¹ exceeds 2.0 NTU in 2 consecutive readings 15 minutes apart at the same filter for two consecutive months</p>	Not applicable	<p>The system must report the filter number, turbidity and dates(s) in which the exceedance occurred and arrange to have a CPE conducted not later than 30 days after the filter exceeded 2.0 NTU for the second straight month. The CPE must be completed and the report submitted within 90 days.</p> <p>[§141.175]</p>	<p>As for IESWTR <i>but</i> the CPE must be arranged not later than <i>60 days</i> after the filter exceeded 2.0 NTU for the second straight month, <i>and</i> must be completed and the report submitted within <i>120 days</i> after the final exceedance.</p> <p>[§141.563]</p>
Disinfection Profile Applicability ²	Not applicable.	<p>All subpart H systems inclusive of community, nontransient noncommunity and transient noncommunity systems.</p> <p>§141.172(b)</p>	<p>Applies to subpart H community or nontransient noncommunity water systems; does <u>not</u> apply to transient noncommunity systems.</p> <p>§141.530</p>
Determining if a Disinfection Profile is Unnecessary	Not applicable	<p>If a system's annual average TTHM and HAA5 levels are below 0.064 mg/L and 0.048 mg/L, respectively.</p> <p>The annual average is calculated as the arithmetic average of the quarterly averages of four consecutive quarters of monitoring.</p> <p>[§141.172]</p>	<p>Same TTHM and HAA5 values specified in IESWTR.</p> <p>At State discretion, values may be determined by samples collected after January 1, 1998 during the month with the warmest water temperature and at the point of maximum residence time in the distribution system.</p> <p>[§141.531]</p>

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Subject	SWTR	IESWTR	LT1ESWTR
Developing a Disinfection Profile - Monitoring Frequency and Compliance Dates	Not applicable	Daily monitoring, for a period of 12 consecutive months for up to three years. Systems must begin monitoring no later than April 1, 2000. [§141.172(b)]	Weekly monitoring, on the same calendar day, over 12 consecutive months. Systems serving 500 to 9,999 persons must begin no later than July 1, 2003; systems serving fewer than 500 must begin no later than January 1, 2004. [§141.532-533]
Developing a Disinfection Profile - Calculating the Log Inactivation for Viruses	If required by the State when a system uses a disinfectant other than chlorine. § 141.72(a)(1) and (b)(1)	Required for systems using either chloramines or ozone for primary disinfection. [§141.172(5)]	Required for systems using either chloramines or ozone or <i>chlorine dioxide</i> for primary disinfection. [§141.535]
Additional Reporting Requirements for Single Exceedance of the Maximum Allowable Turbidity Limit	If at any time the turbidity exceeds 5 NTU, the system must consult with the primacy agency as soon as practical but no later than 24 hours after the exceedance is known, in accordance with the public notification requirements under 141.203(b)(3) [§141.75(b)(3)(ii)]	If at any time the turbidity exceeds the maximum turbidity level (1 NTU for conventional or direct filtration systems of State-set level for alternative filtration systems), the system must inform the State as soon as possible, but no later than the end of the next business day.* [§141.175(c)] *141.203(b)(3) of the PN Rule supercedes this reporting requirement.	N/A 141.203(b)(3) of the PN Rule applies.

1. Where reference to the turbidity of an individual filter is made, this also applies to the turbidity of the combined filter effluent for subpart T conventional or direct filtration systems that have 2 or fewer filters and continuously monitor the CFE from those filters in lieu of individual filter monitoring.
2. Compliance dates for new DBP MCLs, disinfectant MRDLs, and related monitoring requirements are specified in the Stage 1 DBP Rule. They are:
 1. Subpart H community and non-transient non-community systems serving 10,000 or more people must comply beginning January 1, 2002.
 2. All other community and non-transient non-community systems must meet the MCLs and MRDLs beginning January 1, 2004.
 3. Subpart H transient non-community systems serving 10,000 or more persons and using chlorine dioxide as a disinfectant or oxidant must comply with the chlorine dioxide MRDL beginning January 1, 2002.
 4. Subpart H transient non-community systems serving fewer than 10,000 persons and systems using only ground water not under the direct influence of surface water and using chlorine dioxide as a disinfectant or oxidant must comply with the chlorine dioxide MRDL beginning January 1, 2004.

3.2 Overview of Implementation

Implementation activities for LT1ESWTR should recognize the resource limitations and related compliance burdens of small systems. This means monitoring, reporting, performance, and follow-up requirements should be clearly defined to assist system understanding of how the rule will affect them and what they must do to comply. To meet this goal, the main implementation activities expected to face all primacy agencies include the following:

- Identify affected systems.
- Identify system-specific requirements.
- Communicate requirements to the affected systems.
- Update data systems.
- Assess optional TTHM and HAA5 monitoring data and more representative profiling data.
- Review demonstration data for alternative filtration technologies and establish turbidity limits.
- Evaluate the adequacy of Watershed Control Programs for *Cryptosporidium* for unfiltered systems.
- Ensure training opportunities are available for systems and field staff/personnel to learn how to perform filter self-assessments and report results.
- Obtain and Maintain a list of approved third-parties for conducting CPEs and/or develop and maintain State staff CPE expertise and availability.
- Evaluate monthly filter performance reports for combined filter effluent and individual filtered water turbidity exceedances.
- Evaluate reports of filter self-assessments and determine if additional action is necessary.
- Evaluate the results of CPEs and determine if additional action is necessary.
- Track regulated system compliance progress and implement enforcement action as needed.
- Review disinfection profiles during sanitary surveys.
- Consult with systems regarding changes in disinfection practices.

Each of these items is discussed in more detail later in this Section. In addition, an overview of the Area Wide Optimization Program, an implementation tool for both the IESWTR and LT1ESWTR is included.

There are two technical guidance documents prepared for the LT1ESWTR which will be useful to State agencies and water systems and are noted in Section 2. They are:

LT1ESWTR Technical Guidance Document for Turbidity, and
LT1ESWTR Technical Guidance Document for Disinfection Profiling and Benchmarking

These documents are written with smaller water system operators and managers as the intended audience, but contain information explaining and interpreting implementation requirements for LT1ESWTR.

3.3 Identify Affected Systems

3.3.1 New Construction of Finished Water Reservoirs

Under the LT1ESWTR all subpart H systems serving fewer than 10,000 persons must cover all new finished water reservoirs constructed on or after March 15, 2002. The effective date for this provision in the IESWTR was February 16, 1999. All subpart H public water systems serving fewer than 10,000 people should be notified of this requirement.

Implementation and enforcement of this requirement will likely be addressed (if it is not already) through State-specific engineering design and specification plan review and approval processes. State agencies responsible for the plan review and approval process, consulting engineers and water system owners, operators and managers should be informed of the change and its effective date. Care should be taken to ensure any plans and specifications currently in the design or review process accommodate this provision as the deadline applies to the reservoir's date of construction, not the design submission date.

3.3.2 Affected Surface Water or GWUDI Systems

The Surface Water Treatment Rule (SWTR) addresses treatment technique and monitoring requirements for all systems using surface water or GWUDI. The Interim Enhanced Surface Water Treatment Rule affects the subset of those systems which serve 10,000 or more people. The LT1ESWTR fills in the gap by affecting all remaining surface water or GWUDI systems serving fewer than 10,000 people. Because the treatment technique requirements imposed by the SWTR were based on the type of filtration technology employed, and the IESWTR and LT1ESWTR follow the same treatment technology categories, State databases should contain the appropriate information to identify systems affected by LT1ESWTR. Each of these systems should receive information on the rule's requirements.

State's may choose to develop information packages that are targeted toward specific system requirements as much as possible. For example, the following table identifies the different types of treatment systems and their specific provisions on which the information packages may focus:

Table 3.2 - Treatment Systems and Information Package Focus Issues

System Type	System Focus
Unfiltered	<ul style="list-style-type: none"> Watershed Control Program Addresses <i>Cryptosporidium</i> Disinfection Profiling & Benchmarking*
Slow Sand/Diatomaceous Earth Filtration	<ul style="list-style-type: none"> Combined Filter Effluent Turbidity Disinfection Profiling & Benchmarking*
Conventional/Direct Filtration	<ul style="list-style-type: none"> Combined Filter Effluent Turbidity Installation of Individual Filter Effluent Turbidimeters Individual Filter Effluent Turbidity Follow-Up Actions required for Individual filter Effluent Turbidity Exceedances Filter Self-assessment Procedures CPE Contact Information Disinfection Profiling & Benchmarking*
Alternative Filtration	<ul style="list-style-type: none"> Inactivation/Removal Demonstration Data Combined Filter Effluent Turbidity with State-determined Turbidity Limits Disinfection Profiling & Benchmarking*
Reclassified systems now serving over 10,000 people	<ul style="list-style-type: none"> Disinfection Profiling under IESWTR Compliance with other IESWTR Requirements

* Disinfection profiling and benchmarking requirements apply only to community and non-transient, non-community water systems.

While materials EPA has prepared to address the requirements of the rule are all-inclusive, efforts to clearly identify which aspects pertain to each system may be helpful to small system understanding and compliance. Efforts may be limited to discussion in a cover letter or extend to the development of technology-specific materials.

3.4 Identify System-Specific Requirements

Some provisions of the LT1ESWTR allow State discretion in establishing treatment technique or monitoring requirements. The special primacy requirements for LT1ESWTR address these discretionary items and are discussed in Section 4.4 of this guidance. Although that section describes how a State might satisfy the requirements and obtain primacy, States must also inform the systems what their specific requirements will be. Systems should know their requirements with sufficient lead time to meet the compliance dates of each aspect of the rule.

The two main provisions for which States must make a timely decision on what they will require of systems are:

1. Review of alternative filtration demonstration data to establish State-determined 95th and maximum turbidity limits for alternative filtration technologies (which the system must meet beginning January 15, 2005), and
2. What constitutes a more representative data set for optional TTHM and HAA5 monitoring and disinfection profiling (which will affect system monitoring as early as July 1, 2003).

States should refer to the section in this document on Special Primacy Requirements. The State's primacy application for the IESWTR is also a good resource since these issues may also have been addressed in the implementation of that rule.

3.5 Communicate LT1ESWTR Requirements to Affected Systems

3.5.1 Target Notification Time Frames

Disinfection Profiling Requirements

States should consider notifying CWS and NTNCWS's of the disinfection profiling requirements as soon as possible and no later than May, 2002. This would allow systems a full year to have their water analyzed for optional TTHM and HAA5 levels and possibly qualify to forgo the disinfection profiling and benchmarking requirements. This optional monitoring must occur during the month with the warmest water temperature and at the point of maximum residence time in the distribution system. If the State determines that a disinfection profile is still needed, the system would then have time to plan for and begin disinfection profiling. Disinfection profiling must begin no later than July 1, 2003 for systems serving 500 to 9,999 people and no later than January 1, 2004, for systems serving fewer than 500.

Strengthened Turbidity Provisions

A target implementation time frame for notifying systems of the strengthened turbidity requirements may fall within the same period. While the turbidity requirements are not effective until January 14, 2005, this lead-time would enable systems to improve treatment performance, purchase and install equipment and implement any changes necessary to begin continuous monitoring of individual filter turbidity. In addition, this lead time would allow States the option to conduct on-site visits to ensure that turbidimeters/data recorders are properly installed and operating prior to the compliance date.

3.5.2 Written Notification for Affected Systems

Benefits of Written Notification

Providing public water systems written notice of a final rule serves two purposes: 1) it provides a hard-copy document the primacy agency may file and use in subsequent compliance tracking efforts, and 2) the receiving system obtains a formal notice of upcoming regulatory requirements (in addition to EPA's publication of the rule in the Federal Register).

Written notification of rule requirements should be accompanied by a letter from the State which directs the reader to an appropriate contact if questions arise. An example cover letter is provided as Figure 3.1. In this example, a single letter is used for the mailing to all affected systems. As discussed in Section 3.3.2, States may wish to tailor the letter to accommodate those systems for which the provisions are either limited or unique.

Mailing Enclosures: LT1ESWTR Quick Reference Guide/Fact Sheets

Appendix C of this guidance includes a Quick Reference Guide, a general LT1ESWTR Fact Sheet, two Fact Sheets on Turbidity, a Fact Sheet for Disinfection Profiling, and a Fact Sheet for Disinfection Profiling and Benchmarking. These publications are intended to be distributed to water systems through mailings, training sessions or other educational forums and may be a beneficial enclosure with the initial written notification sent to systems. They provide overviews of the LT1ESWTR to enable systems to determine which of the rule's provisions apply to their system. One or more of these publications in an initial mailing would save State effort for summarizing key requirements.

In addition to summarizing LT1ESWTR requirements, these resources describe benefits and general implications of the rule but are not a substitute for actual regulatory language. Once affected systems are identified, actual rule provisions may be a more appropriate long-term reference. Final rule language is provided in Appendix B. Copies of the Quick Reference Guide and Fact Sheets may be copied from Appendix C and are available from the EPA web site at <http://www.epa.gov/safewater/mdbp/lt1eswtr.html>.

3.5.3 Other Communication

Slide Presentation

Adult education training emphasizes that adults, like children, respond differently to written, verbal and visual educational techniques. For some audiences, written presentation of the rule alone will not result in comprehension of system requirements. Slide presentations of the LT1ESWTR may be used by State staff and other technical assistance or training providers to present the background of the rule, rule requirements and its benefits.

The EPA Drinking Water Academy has developed a training session on the LT1ESWTR (available in PowerPoint format). Copies of the presentation may be used to train other State personnel and technical assistance resources, water system personnel and the public. EPA's Drinking Water Academy slides are available electronically by accessing the EPA Web Site at <http://www.epa.gov/safewater/mdbp/lt1eswtr.html>.

Guidance Documents and Seminars

Materials developed for the LT1ESWTR technical guidance documents are useful for conveying rule requirements and to discuss specific implementation aspects of the regulation. These aspects may include how to perform and report a filter profile, a filter self-assessment, a disinfection profile or a disinfection benchmark. Proper completion of data reporting forms will also be a critical component of system compliance. The guidance documents could be used as participant materials in LT1ESWTR-specific training events. See Section 2 of this manual for more information on these references.

Figure 3.1: Example System Notification Letter

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State Letterhead

John Smith, Supt.
Town Water System, PWSID XXXXXXXX
Town, ST 12345

RE: Long Term 1 Enhanced Surface Water Treatment Rule

Dear Mr. Smith:

On January 14, 2002, the Long Term 1 Enhanced Surface Water Treatment Rule was published in the Federal Register. This letter is being provided to notify you that your public water system may be affected by this rule.

The Long Term 1 Enhanced Surface Water Treatment Rule (abbreviated LT1ESWTR) applies to public water systems that meet both of the following criteria:

1. Use surface water or ground water under the direct influence of surface water, and
2. Serve fewer than 10,000 people.

The rule will impact your watershed control program if you are an unfiltered system. If you are a filtered system, it will impact the performance and monitoring of your filtration plant if you use conventional, direct or an alternative filtration technology. Whether filtered or not, the rule requires monitoring and reporting related to microbial inactivation, for which you may need to take specific action by July 1, 2003 [or January 1, 2004] unless optional TTHM and HAA5 monitoring is conducted and this agency has determined a profile is unnecessary. Systems using alternative filtration technologies are required to submit appropriate removal and inactivation demonstration data. Other provisions become effective on January 14, 2005.

A Quick Reference Guide and Fact Sheets for the LT1ESWTR are enclosed. The guide provides more information on this regulation and the Fact Sheet explains the requirements for disinfection byproduct profiling and benchmarking in more detail.

You are receiving this letter as our data shows your system uses surface water or ground water under the direct influence of surface water. Please contact this office at XXX-XXXX if you have any questions about this letter or the LT1ESWTR and its affect on your system. We appreciate your attention to this request.

Sincerely,

Enclosures: LT1ESWTR Quick Reference Guide, LT1ESWTR General Fact Sheet

LT1ESWTR Fact Sheet: Turbidity Provisions for Conventional and Direct Filtration Systems

LT1ESWTR Fact Sheet: Turbidity Provisions for Slow Sand, Diatom. Earth and Alt. Filtration

LT1ESWTR Fact Sheet: Disinfection Profiling and Benchmarking for LT1ESWTR

LT1ESWTR Fact Sheet: Disinfection Profiling for the LT1ESWTR

3.6 Update Data Systems

EPA recognizes State data management systems vary to suit State-specific requirements and needs. It is recommended, however, that State data systems be updated to enable efficient tracking of affected systems, compliance status and other information of use in implementing the rule.

Records to be kept by States, as required under §142.14, include: turbidity measurements, disinfectant residual measurements and other parameters necessary to document disinfection effectiveness, decisions made on a case-by-case or system-by-system basis, consultations regarding disinfection practices, alternative filtration technology decisions, systems required to do filter self-assessments or CPEs, and others. While many of these may be maintained through hard-copy files, data systems which easily identify systems for which these records exist may also be helpful. Data systems able to identify IFE follow-up action triggers may be particularly useful to track and identify systems having performance problems.

3.7 Assess Optional TTHM and HAA5 Monitoring Data and More Representative Profiling Data

The LT1ESWTR requires systems to develop a disinfection profile unless the State determines the profile is unnecessary. The State may determine the profile is unnecessary if all of the following conditions are met:

- the system's TTHM and HAA5 levels are below 0.064 mg/L and 0.048 mg/L, respectively,
- the samples were collected after January 1, 1998, and
- the samples were collected during the month with the warmest water temperature and at the point of maximum residence time in the distribution system.

To assess the optional TTHM and HAA5 data, the State must have a means of determining if the samples met each of the criteria. Laboratory monitoring results will document the analytical results and sample collection date. However, that the sample was collected during the month of the warmest water temperature and at the point of maximum residence time in the distribution system may require system-specific information.

Water temperature data is required for unfiltered surface water systems as part of their calculation of daily total inactivation ratios for compliance with the SWTR. These systems would have data readily available to identify the month of warmest water temperature. Monitoring water temperature at entry points to the distribution system is also required for systems collecting water quality parameter data for compliance with the Lead and Copper Rule. However, this data may only be collected every six-months and may not sufficiently reflect annual changes in temperature. Although not required, systems may record raw water temperature data as part of their process control and recordkeeping practices for surface water treatment systems. Obtaining this data or a statement from the system that they have the data and they identified the month of warmest water temperature may meet this need. Verification of the month used could be incorporated into review of records during the system's Sanitary Survey.

Identification of the point of maximum residence time of water in the distribution system is a requirement

of the Stage 1 DBPR. For the rule, systems serving fewer than 10,000 persons must have submitted to the State a monitoring plan for monitoring locations, including the point of maximum residence time, no later than 30 days after December 16, 2003. Procedures used to identify the maximum residence time for Stage 1 DBPR compliance should be used for the LT1ESWTR.

Identifying State practices or procedures for how the State will approve a more representative data set for optional TTHM and HAA5 monitoring is a special primacy requirement of the LT1ESWTR. Guidance for this special primacy requirement is found in Section 4.4 of this document.

3.8 Review Demonstration Data for Alternative Filtration Technologies and Establish Turbidity Limits

Identifying State practices or procedures for how the State will determine that a public water system may use an alternative filtration technology and how the State will set turbidity performance requirements is a special primacy requirement of the LT1ESWTR. Guidance for this special primacy requirement is found in Section 4.4 of this document.

3.9 Evaluate the Adequacy of Watershed Control Programs for *Cryptosporidium* for Unfiltered Systems

Watershed control programs for unfiltered systems must include provisions for minimizing the potential for contamination by *Cryptosporidium* oocysts in the source water. As a minimum, the rule specifies this must include identification of watershed characteristics and activities which may have an adverse effect on source water quality, and monitoring the activities. These requirements are identical to those included in the IESWTR. Therefore, the same considerations would likely be included in the watershed control programs for small systems.

In the Implementation Guidance for the IESWTR, the types of prevention measures applicable to *Cryptosporidium* are discussed. These same measures should be applied to systems subject to the LT1ESWTR. For IESWTR, EPA considered the types of prevention measures that have been taken to address *Giardia* applicable for use to address *Cryptosporidium*. An onsite assessment of each watershed may be needed to determine if additional steps are needed. Additional considerations which may be appropriate for *Cryptosporidium* include:

- Standard disinfection practices and disinfectant residuals effective for inactivation of *Giardia* may not be effective against *Cryptosporidium* so minimizing the potential for their occurrence in a watershed is the main barrier providing public health protection.
- Animal agriculture as a non-point source of *Cryptosporidium* has been implicated as the source of waterborne disease outbreaks. Range cattle or other sparse use of watersheds for domestic animals may not be desirable.
- Monitoring methods for *Cryptosporidium*, as well as for *Giardia*, are limited in precision and accuracy and may result in false-negative results. Reliance on monitoring to indicate other than gross contamination may not be warranted.

As with the SWTR, any system that fails to meet the watershed control requirements for unfiltered systems must install filtration within 18 months. Systems have until January 15, 2005 to incorporate *Cryptosporidium* into their plans. The adequacy of a system's watershed control program is reviewed by the State or approved third party during annual on-site inspections required under the SWTR.

3.10 Ensure Training Opportunities are Available - Filter Self-Assessments and Report Results

Filter self-assessments are triggered by the monitoring results of individual filter effluent turbidity for conventional and direct filtration systems. For systems continuously monitoring the combined filter effluent of two filters to meet the individual filter effluent monitoring provision, both filters must undergo a self-assessment. The assessment must be completed and reported to the State as completed within 14 days of the trigger.

The *EPA Guidance Manual for LT1ESWTR Turbidity Provisions* has a chapter dedicated to filter self-assessments; including analysis of a typical filter profile, hydraulic loading, backwash practices, examining filter media and other issues related to the filter. A filter self-assessment worksheet is provided in that document to help ensure all applicable items are addressed. The worksheet is provided here as Table 3.3.

A training video is also available, *The LT1ESWTR Filter Self-Assessment*, which demonstrates how a filter is evaluated and how conclusions are derived from the process.

While written and video-based materials are available, States may also need on-site training events where participants are able to perform the steps themselves. Providing opportunities for systems to learn proper methods is important for several reasons. They are:

- To ensure meaningful information is collected which can then be acted-on.
- To ensure the system complies with the regulatory requirements of a self-assessment.
- To ensure damage is not done to the filter during an improperly performed assessment.

Training opportunities and readily-available technical assistance providers may both be appropriate answers to ensuring self assessments are completed properly.

Table 3.3: Individual Filter Self-Assessment Worksheet

Topic	Description	Information
General Filter Information	Type (mono, dual, mixed, pressure, or gravity)	
	Number of filters	
	Filter / rate control (constant, declining)	
	Type of flow control (influent wier, valves)	
	Surface wash type (rotary, fixed, none)/Air Scour	
	Configuration (rectangular, circular, square)	
	Dimensions (length, width, diameter, height of side walls)	
	Max depth of water above media	
	Surface area per filter (ft ²)	
Hydraulic Loading Conditions	Average operating flow (mgd or gpm)	
	Peak instantaneous operating flow (mgd or gpm)	
	Average hydraulic surface loading rate (gpm/ft ²)	
	Peak hydraulic surface loading rate (gpm/ft ²)	
	Changes in hydraulic loading rate (gpm/ft ²)	
Media Design Conditions Based on Design Specifications	Depth, type	
	Media 1	
	Media 2 (if applicable)	
	Media 3 (if applicable)	
Actual Media Conditions Based on Core Samples and Excavation	Depth	
	Media 1	
	Media 2 (if applicable)	
	Media 3 (if applicable)	
	Presence of mudballs, debris, excess chemical, cracking, worn media	

Table 3.3 (continued)

Support Media/Under-drain Conditions	Is the support media evenly placed (deviation <2 inches measured vertically) in the filter bed?	
	Type of underdrains	
	Evidence of media in the clearwell or plenum	
	Evidence of boils/vortexing during backwash	
Backwash Conditions	Backwash initiation (headloss, turbidity/particle counts, time)	
	Sequence (surface wash, air scour, flow ramping, filter-to-waste)	
	Duration (minutes) of each step	
	Introduction of wash water (via pump, head tank, distribution system pressure)	
	Backwash rate (gpm/ft ²) at each step	
	Bed expansion (percent)	
	Coagulant or polymer added to wash water	
	Backwash termination (time, backwash turbidity, visual inspection, or other)	
Placing the filter back into service	Delayed start, slow start, polymer addition, or filter to waste	
Policies and Practices		
Other Considerations	Leaking valves	
	Malfunction rate of flow control valves	
	Chemical feed problems	
	Rapid changes in raw water quality	
	Equal flow distribution to each filter	

3.11 Obtain and Maintain Expertise to Perform CPEs

The rule states either the State or a third-party approved by the State must perform a CPE if triggered by individual filter effluent monitoring for conventional and direct filtration systems. The IESWTR also included this requirement so State programs may have already met this need.

A handbook is available which describes the CPE process (as part of a Composite Correction Program), *Optimizing Water Treatment Plant Performance using the Composite Correction Program*. EPA/625/6-91/027. In addition, EPA sponsors several training events each year for State and EPA Regional Staff on performing CPEs. While performance problems may affect systems of any size, the large number of small systems subject to the LT1ESWTR increases the likelihood a CPE will be triggered. A larger resource pool may therefore be necessary to meet system needs once the individual filter effluent turbidity triggers are in effect.

3.12 Evaluate Monthly Filter Performance Reports

Because the reporting requirements for combined filter effluent and individual filter effluent turbidity are the same for both the IESWTR and LT1ESWTR, systems may use the same data reporting forms for compliance with both rules. It is expected States already have reporting forms or policies on reporting formats available for system use.

The LT1ESWTR Guidance Manual for Turbidity Provisions includes Example Report Forms, reproduced here as Figures 3.2 and 3.3. Figure 3.4 provides an example of interpreting a completed form.

**Figure 3.2: Example CFE Reporting Form for Conventional or Direct Filtration
For Combined Filter Effluent (Under Revision)**

CONVENTIONAL AND DIRECT FILTRATION PLANTS
MONTHLY REPORT FOR COMBINED FILTER EFFLUENT
Due by the 10th of the Following Month

Month:
Year:
PWSID:

System/Treatment Plant:
Treatment Type¹:
of Filters:

A	B	C	D²	E²	F²	G³	H³	I⁴	J⁵	K	L
	Operating Time	Influent Water Treated	Raw	Treated	Raw	Coagulant Name:	Coagulant Name:	Maximum Combined Filter Effluent	No. of Turbidity Measur.	No. of Turbidity Measur. <= 0.3 NTU	No. of Turbidity Measur. >1 NTU
Day	Hrs/Day	Gal/Day	pH	pH	NTU	PPM	PPM	NTU			
1											
2											
3											
4											
5											
6											
7											
8											
9											
10											
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											
21											
22											
23											
24											
25											
26											
27											
28											
29											
30											
31											
Totals:											0

Number of monthly readings (Total of Column J)=

Number of monthly readings <= 0.3 NTU (Total of Column K) =

The percentage of turbidity measurements meeting the specified limits = (Column K/Column J) x 100

Record the date and turbidity value for any measurements exceeding 1 NTU:

If none, enter "None".

Prepared by: _____

Date: _____

Date	Turbidity Readings > 1 NTU

Notes for Figure 3.2: Example CFE Reporting Form for Conventional or Direct Filtration:

1. Treatment type refers to Conventional or Direct filtration. Treatment type should be the current operational practice.
2. The readings for raw/treated pH and raw NTU in Columns D, E, and F, are from one grab sample taken during the 24-hour period or average readings if generated from computer readings.
3. Coagulant name is the brand name of the coagulant(s) used to treat the source water. For example: one column is for liquid/dry alum and the other is for the type of polymer, if used.
4. To complete Column I, report the highest clearwell effluent turbidity value of those recorded at the four-hour intervals. Sampling locations which would satisfy clearwell effluent requirements include:
 - a. A sample point which represents the combined filter effluent prior to entry into a clearwell;
 - b. The clearwell effluent;
 - c. The plant effluent immediately prior to entry into a distribution system; or
 - d. The average of individual filter effluent measurements collected at one time.
5. To complete Column J, enter the number of turbidity measurements taken each day, not the actual turbidity values obtained. To determine minimum sampling frequencies for finished water turbidity, grab sampling or continuous monitors, use the option listed below that best pertains to actual daily plant operating time:
 - a. For 24 hours of continuous plant operation without interruption, record turbidity values every four (4) hours (e.g., 12:00 a.m., 8:00 a.m., 12:00 noon, 4:00 p.m., 8:00 p.m.).
 - b. For more than four hours but less than 24 hours of continuous operation without interruption, record turbidity values any time during the first four hours of operation and then every four hours from the time of the initial turbidity sample.
 - c. For plants which operate intermittently and for less than four hour intervals, record the turbidity value at the end of each operating period.

Daily records of the clearwell effluent and filter(s) turbidity values recorded must be retained by the public water supplier and made available to the State or Primacy Agency for review by the 10th of the following month.

**Figure 3.3: Example CFE Reporting Form for Conventional or Direct Filtration
For Individual Filter Effluent (Under Development)**

CONVENTIONAL AND DIRECT FILTRATION PLANTS
MONTHLY REPORT OF DATA FOR INDIVIDUAL FILTER EFFLUENT
Due by the 10th of the Following Month

Month:

Year:

PWSID:

Treatment Type¹:

System/Treatment Plant:

Filter #:

A	B	C	D ²	E ³	F ⁴	G ⁵	H ⁶
Day	Operating Time	Individual Filter Influent Water Treated	Influent Turbidity	Maximum Filter Effluent	No. of Turbidity Measur.	No. of Turbidity Measur. > 1.0 NTU for two or more consecutive 15-minute readings	No. of Turbidity Measur. > 2.0 NTU for two or more consecutive 15-minute readings
	Hrs/Day	Gal/Day	NTU	NTU			
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
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26							
27							
28							
29							
30							
31							

Prepared by:

Date:

Notes for Figure 3.3: Example CFE Reporting Form for Conventional or Direct Filtration:

1. Treatment type refers to Conventional or Direct filtration. Treatment type should be the current operational practice.
2. The readings for influent NTU, in Columns D, are from one grab sample taken during the 24-hour period or average readings if generated from computer readings. Influent turbidity reading for individual filters can be the same raw turbidity readings recorded for the combined filter effluent.
3. To complete Column E, report the highest filter effluent turbidity value of those recorded at the 15- minute intervals.
4. To complete Column F, enter the number of turbidity measurements taken each day, not the actual turbidity values obtained. Turbidity readings must be taken every 15 minutes.
5. In Column G, record the number of events in the day when two or more consecutive 15-minute readings exceed 1.0 NTU. If two or more consecutive 15-minute readings exceeded 1.0 NTU during the month, an Exceptions Report is due by the 10th of the following month which includes the filter number(s), corresponding date(s), time, the turbidity value(s) which exceeded 1.0 NTU, and reason for exceedance (if known). If the same filter exceeds 1.0 NTU in two or more consecutive 15-minute readings for three consecutive months, then the system must conduct a filter self-assessment.
6. In Column H, record the number of events in the day when two or more consecutive 15-minute readings exceeded 2.0 NTU. Again, an Exceptions Report described in Number 5 is needed if this happens any time throughout the month. If a filter exceeds 2.0 NTU in two or more consecutive 15-minute readings for two consecutive months, then the system must arrange for a CPE.

The system must submit this worksheet (or information contained on this worksheet) to the State or Primacy Agency by the 10th of the following month that demonstrates the system has conducted individual filter monitoring. Also, the system must report when two or more consecutive 15-minute readings exceeded 1.0 NTU and 2.0 NTU. Exceptions Reports must be submitted with the individual filter information in the event of an exceedance.

**Figure 3.4: Example CFE Reporting Form for Conventional or Direct Filtration
For Combined Filter Effluent - Completed (Under Revision)**

EXAMPLE 4-1											
CONVENTIONAL AND DIRECT FILTRATION PLANTS											
MONTHLY REPORT FOR COMBINED FILTER EFFLUENT											
Due by the 10th of the Following Month											
Month: Sept		System/Treatment Plant: Townville						CHECK ONE			
Year: 2005		Treatment Type: Conv						<input checked="" type="checkbox"/> Community			
PWSID: _____		# of Filters: 4						<input type="checkbox"/> Non-Community			
A	B	C	D	E	F	G	H	I	J	K	L
						Coagulant	Coagulant	Maximum			
						Name:	Name:	Combined		No. of	No. of
	Operating	Influent				Alum		Filter	No. of	Turbidity	Turbidity
	Time	Water Treated	Raw	Treated	Raw			Effluent	Turbidity	Measur. <=	Measur.
Day	Hrs/Day	Gal/Day	pH	pH	NTU	PPM	PPM	NTU	Measur.	0.3 NTU	>1 NTU
1	24	20000	6.0	6.0	5	2.0		0.2	6	6	0
2	24	20000	6.0	6.0	5	2.0		0.1	6	6	0
3	24	20000	6.0	6.0	7	2.0		0.1	6	5	0
4	24	20000	6.0	6.0	5	2.0		0.4	6	5	0
5	24	20000	6.0	6.0	5	2.0		0.2	6	6	0
6	24	20000	6.0	6.0	5	2.0		0.1	6	6	0
7	24	20000	6.0	6.0	10	2.0		0.5	6	4	0
8	24	20000	6.0	6.0	5	2.0		0.2	6	6	0
9	24	20000	6.0	6.0	5	2.0		0.1	6	6	0
10	24	20000	6.0	6.0	5	2.0		0.1	6	6	0
11	24	20000	6.0	6.0	5	2.0		0.1	6	6	0
12	24	20000	6.0	6.0	5	2.0		0.1	6	6	0
13	24	20000	6.0	6.0	5	2.0		0.1	6	6	0
14	24	20000	6.0	6.0	5	2.0		0.1	6	6	0
15	24	20000	6.0	6.0	5	2.0		0.1	6	6	0
16	24	20000	6.0	6.0	5	2.0		0.1	6	6	0
17	24	20000	6.0	6.0	5	2.0		0.1	6	6	0
18	24	20000	6.0	6.0	5	2.0		0.1	6	6	0
19	24	20000	6.0	6.0	5	2.0		0.1	6	6	0
20	24	20000	6.0	6.0	5	2.0		0.1	6	6	0
21	24	20000	6.0	6.0	5	2.0		0.1	6	6	0
22	24	20000	6.0	6.0	5	2.0		0.1	6	6	0
23	24	20000	6.0	6.0	5	2.0		0.1	6	6	0
24	24	20000	6.0	6.0	5	2.0		0.1	6	6	0
25	24	20000	6.0	6.0	5	2.0		0.1	6	6	0
26	24	20000	6.0	6.0	5	2.0		0.1	6	6	0
27	24	20000	6.0	6.0	5	2.0		0.1	6	6	0
28	24	20000	6.0	6.0	5	2.0		0.1	6	6	0
29	24	20000	6.0	6.0	5	2.0		0.1	6	6	0
30	24	20000	6.0	6.0	5	2.0		0.1	6	6	0
31	24	20000	6.0	6.0	5	2.0		0.1	6	6	0
								Totals:	186	182	
Number of monthly readings =						186					
Number of monthly readings <= 0.3 NTU =						182					
The percentage of turbidity measurements meeting the specified limits, Column K/Column J X 100 =											
(182/186)X100 = 98%											

When evaluating the monthly reporting forms, data is reviewed for compliance with the system-specific treatment technique requirement (conventional and direct filtration treatment systems must meet the CFE turbidity limit of no more than 0.3 NTU in at least 95 percent of the samples recorded at least in 4 hour intervals, and at no time exceed 1 NTU) as well as triggers of additional follow-up actions based on continuous individual filter effluent monitoring (or CFE if the system has two or fewer filters). Systems are required to report this information to the State by the 10th of the following month. The example forms provided as Figures 3.2 and 3.3 have columns where trigger data is clearly identified. If other forms are used, States should consider how the data recorded will clearly indicate a trigger or violation.

Non-regulatory items States may wish to implement in the event a trigger occurs include the following:

- If turbidity exceeds 1.0 NTU in 2 consecutive recordings 15 minutes apart...

The system must report the cause of the exceedance if known. Reporting of corrective measures to prevent reoccurrence is not required, but may be requested. If the cause is not known, the rule does not specify what must be done. A technical assistance visit may be in order to help identify potential causes, or to assist with development of a filter profile. Filter profiles are required for this trigger for systems subject to the IESWTR. A filter profile is a plot of individual filter performance, based on continuous turbidity measurements or total particle counts verses time for an entire filter run, from startup to backwash inclusively, including while another filter is being backwashed. Filter profiles can provide information on mid-run interruptions. More information on filter profiles is available in the *LT1ESWTR Technical Guidance Document for Turbidity*.
- If a (optional) filter profile or turbidity data indicate an ongoing problem...

Systems need not wait for filter self-assessments to be triggered by the rule before implementing this type of study. Filter self assessments are detailed evaluations of a filter's performance and items that may affect its performance. Suggestions for completing the filter self-assessment and interpreting results is also available in the *LT1ESWTR Technical Guidance Document for Turbidity*.

3.13 Evaluate Reports of Filter Self-Assessments

Minimum required elements of a filter self assessment are:

- assessment of filter performance;
- development of a filter profile;
- identification and prioritization of factors limiting filter performance;
- assessment of the applicability of corrections; and,
- preparation of a filter-self assessment report.

Systems are required by the rule to report to the State they have completed the self-assessment, not provide them with a report. States may want to request a copy of the report, be involved in performance of the assessment and production of the report or schedule a site visit to review the report with the system immediately after its completion. Items to evaluate would include whether the problem is correctable

with modified operations practices, targeted operator training with implementation of the training concepts, or if the problem is design-related and not correctable without capital expenditures.

3.14 Evaluate CPE Reports

CPE reports convey the findings of the evaluation and the factors that limit performance of the filtration plant - not just the filters themselves. Staff assigned to evaluate these reports and devise follow-up requirements should be well versed in the operation and design considerations of surface water treatment facilities, as well as the CPE process. Additional items with a schedule for compliance may be required of the system as a result of the CPE. Significant deficiencies which affect the performance of the plant should be evaluated for their immediate risk to public health, with acute health contaminants as the driving force behind their establishment.

3.15 Track System Compliance and Implement Enforcement Action

States may wish to use the federally reportable violations for the LT1ESWTR as the basis for development of the key elements of a tracking system. See Section 5.1.1 for more information on federally reportable violations.

3.16 Review Disinfection Profiles During Sanitary Surveys

System's disinfection profiles must be retained by the system in graphic form, such as a spreadsheet, and must be available for review by the State as part of a sanitary survey. States may choose to have systems submit the profile for review, but this is not required by the LT1ESWTR.

Unless an alternative data set is approved by the State as discussed previously, the disinfection profile is based on one year of weekly monitoring (on the same calendar day) of the following:

- temperature of the disinfected water at each residual disinfectant concentration sampling point during peak hourly flow,
- pH of the disinfected water (if the system uses chlorine) at each residual disinfectant concentration sampling point during peak hourly flow,
- the disinfectant contact time, and
- the residual disinfectant concentration.

Review of this data would address proper sample location, analytical methods used and the form in which the data are recorded and retained. The system may or may not have also used the data to calculate a disinfection benchmark. The review could include a determination of whether benchmark calculations and determinations were performed correctly.

3.17 Consult With Systems Regarding Changes in Disinfection Practices

How the State will consult with the system and approve significant changes to disinfection practices is a special primacy provision of the LT1ESWTR. Guidance for this special primacy requirement is found in Section 4.4 of this document.

3.18 Area-Wide Optimization Programs - An Approach for LT1ESTWR Implementation

The purpose of the LT1ESWTR is to assure that surface water treatment systems provide maximum levels of public health protection from waterborne contaminants. Each surface water treatment system must treat a unique source water with different types and amounts of contaminants before supplying water to their customers. Different plants will also provide different levels of treatment because of the source water quality and the capabilities of their treatment system and operations staff. EPA and State drinking water programs, therefore, must work with a variety of surface water systems and provide oversight to each water system that is appropriate given the source water, plant capabilities, and finished water quality supplied.

Since follow-up actions of the LT1ESWTR are triggered by turbidity values that exceed certain specified levels and public health expectations, States may want to take proactive measures to identify and target lower performing systems before they become out of compliance with the LT1ESWTR. States may then take the necessary actions to help systems with the most need maximize their level of public health protection and subsequently reduce the number of systems triggered into labor and time intensive compliance activities.

Ideally, States would have adequate resources for individualized oversight of all systems. However, realistically State drinking water programs typically have a fixed level of resources available that prevent States from providing assistance to every system in need. Therefore, it is necessary to develop a process to ensure that systems with the most need obtain the required individualized assistance. The Area-Wide Optimization Program (AWOP) is an innovative approach for deploying and prioritizing resources for targeted regulation oversight and technical assistance that States may want to consider as they implement the LT1ESWTR.

3.18.1 Definition of an Area-Wide Optimization Program

An AWOP provides a framework for applying available tools and resources to all surface water treatment systems within a defined area on a prioritized basis. An AWOP allows a State to focus on plants that have the greatest problems complying with the regulation in order to maximize public health protection.. In the case of the LT1ESWTR, by assessing turbidity effluent data, a State will be able to target the systems with the greatest potential for compliance problems, document plant specific performance improvements, and assess the results of LT1ESWTR oversight activities.

A variety of tools are available to provide the required oversight. These can range from inspections to direct technical assistance. There are also various levels of technical assistance tools ranging from daylong trouble shooting site visits to comprehensive performance evaluations (CPEs). States have the flexibility to incorporate the tools they find most appropriate given their resource constraints. However, by using the most appropriate and available technical assistance tools such as turbidity data, filter self-

assessment profiles, and CPEs, implementing an AWOP can help States utilize already existing information and organize it in a way to target oversight activities and, as a result, achieve long-lasting improved performance on a system-by-system basis.

3.18.2 Components of an Area-Wide Optimization Program:

Establishing an AWOP in a State requires that the drinking water program activities be organized to support three interrelated activities. These activity areas are shown in Figure 3.5 and further defined below. The intent of these three types of activities is to create an ongoing, dynamic process that can respond to variations in surface water treatment plant performance.

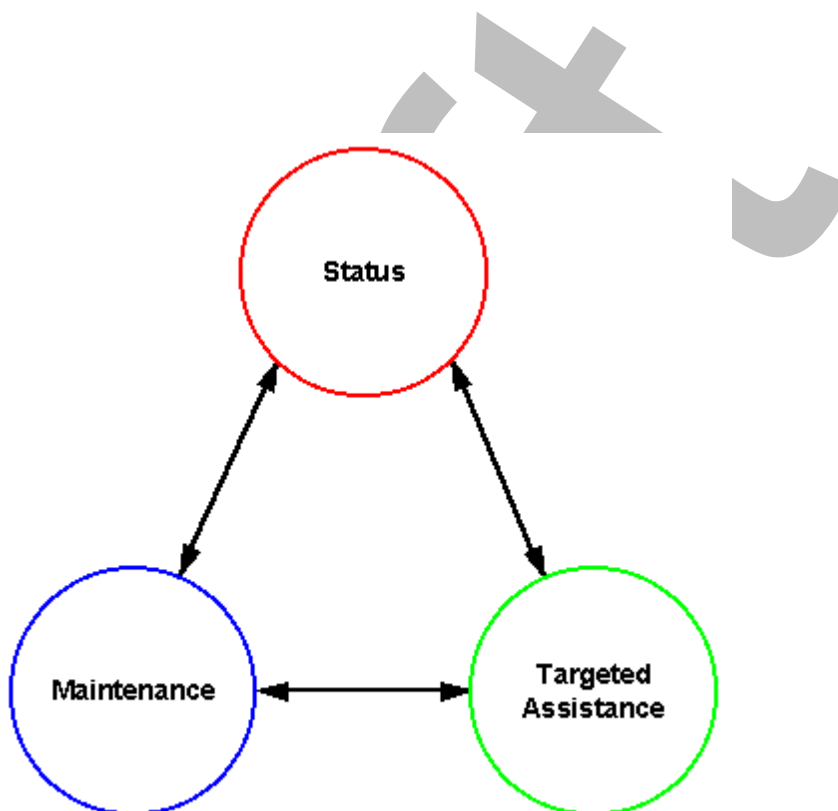


Figure 3.5. Organization of State Drinking Water Program Activities Under an AWOP

Status Activities

Status activities center around establishing the performance goals which the AWOP program will pursue with its filtration plants. Once established, the State formally adopts these goals by informing the affected filtration plants of the performance goals and the expectation or requirement that the plants will meet them. Another status activity is to develop professional relationships with the water utilities in the State to encourage them to pursue continuous performance improvement.

With the performance goals established, the State then uses the performance data supplied from the plants to monitor and assess on a regular basis where the plants stand with respect to the performance goals. This information is then used to prioritize the different plants based on their relative public health risk.

Targeted Assistance Activities

The focus of the targeted assistance activities is to decide which of the various assistance tools available to the State is appropriate for the different plants based on their relative public health risk determined by the status activities. In development of an AWOP the States will assess how their existing activities (e.g., sanitary survey) can assist plants achieve the AWOP performance goals long-term.

More advanced assistance tools may be needed for plants with the highest public health risk. Tools such as the Composite Correction Program (CCP) which includes the Comprehensive Performance Evaluation (CPE) and Comprehensive Technical Assistance (CTA) may be required. Another potential assistance tool is Performance Based Training (PBT) where groups of plants are taken through a series of facilitated training sessions that address key skills to meet the AWOP performance goals.

Other sources of assistance that do not use State personnel can also be used. Plants may be encouraged to join national programs such as the Partnership for Safe Water. States may also choose to work with third-party technical assistance providers (e.g., NRW) to make sure that their assistance complements the AWOP performance goals.

Maintenance Activities

Maintenance activities center around taking lessons learned from the status and targeted assistance activities and refine other related State programs (e.g., design reviews, permitting, training activities, inspections, sanitary surveys, etc.) to better support the AWOP. Any training of staff on new technical tools would also be included in this activity as well as efforts to sustain quality control of all AWOP activities.

3.18.3 Example Use of an Area-Wide Optimization Program

Figure 3.6 shows how an Area-Wide Optimization Program could work for an area, in this case, a county within a State. The dots represent the 18 surface water treatment plants that serve the illustrated county. The plants are required to collect turbidity data and submit it to the State. This data is then put into a standardized format, such as this bar graph, which shows the relative performance (based on turbidity) each plant within the county has achieved over a specified year. In this case the State has assessed each plant relative to the percent of time the plant achieved 0.1 NTU or less. It should be noted that 0.1 NTU is a goal used for plant optimization because research has shown that achievement of this goal represents a higher level of particle removal which is projected to equate to better public health protection. Any other protective goal such as the LT1ESWTR turbidity requirement of 0.3 NTU could also be used.

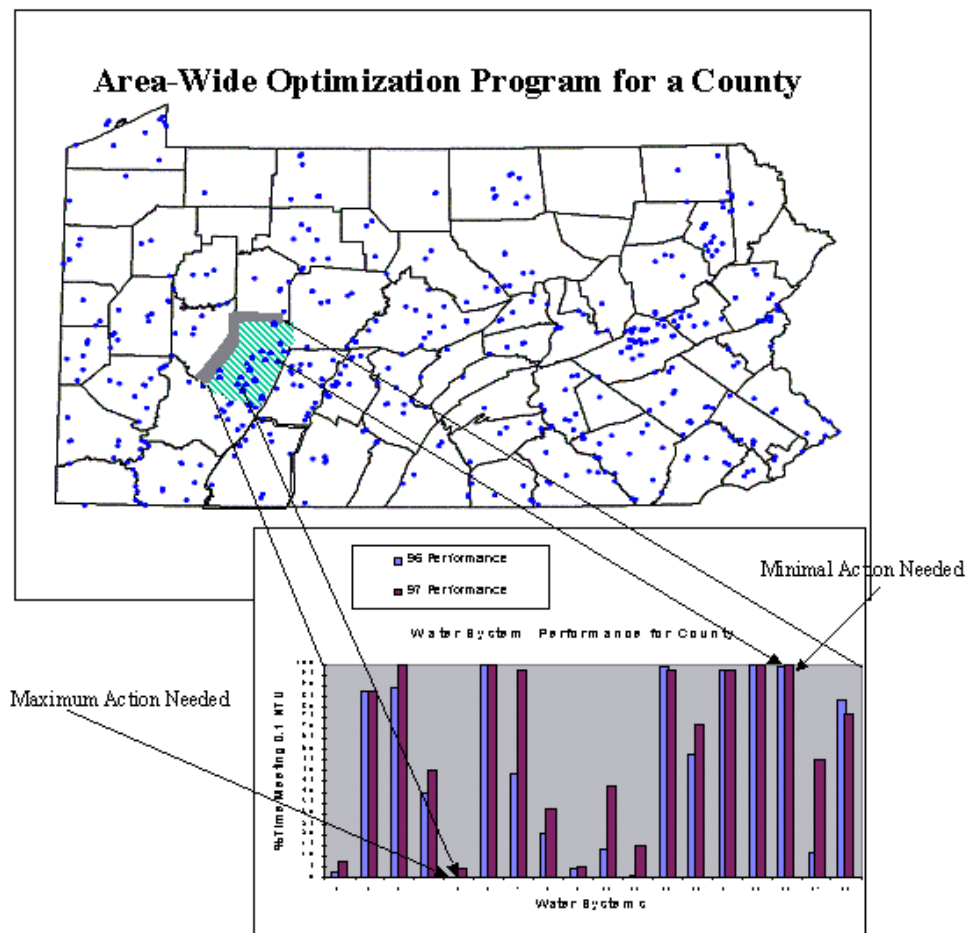


Figure 3.6

From this chart the State can see that systems 1, 5, 9, and 11 are providing the lowest levels of public health protection while systems 3, 6, 12, 14, 15, and 16 are providing the highest. The remaining systems are providing some intermediate levels of public health protection.

With this information developed, the State could then decide what actions to take that move the highest priority plants toward the defined goal. A plant like 12 would only need minimal efforts while system 5 would need the maximum levels of oversight. The State would need to decide what was the appropriate oversight activity given the staff and resources they have to work with.

3.18.4 Benefits of Area-Wide Optimization Programs:

Those regions and States that have implemented AWOPs have found benefits in three categories.

- Benefits to the operation of the State drinking water programs.
- Impacts on the performance of individual plants.
- Impact on the performance of plants State-wide.

The following are benefits found related to the operation of State drinking water programs:

- Those staff involved in AWOP have enhanced their technical capability and that of other persons with whom they interact on other drinking water program activities (e.g., sanitary surveys).
- The tracking of plant performance allows the staff to see the impact of their activities resulting in enhanced motivation and enthusiasm for their jobs. This also allows for adjustments to the State strategy when performance is not being improved by targeted activities.
- When plants understand their role in public health protection and begin tracking their performance as part of an AWOP, they typically make changes that result in improved performance.
- AWOP activities provide small systems the fundamental tools they will need to comply with the LT1ESWTR.
- The results of the AWOP activities have had a positive impact on other drinking water program activities such as operator training, operator certification, and plans review.
- AWOP activities lead to long-term improvements in plant performance by enhancing the operator's ability to apply new technical concepts.
- A formalized network of personnel is developed that can be used to implement future regulatory requirements (e.g., LT2ESWTR, Stage 2 DBPR, etc.).

The most dramatic benefit of AWOP is that these States have achieved improved performance and lowered public health risk at specific surface water treatment systems. Figure 3.6 shows how AWOP activities in one State have dramatically improved the performance of two water systems

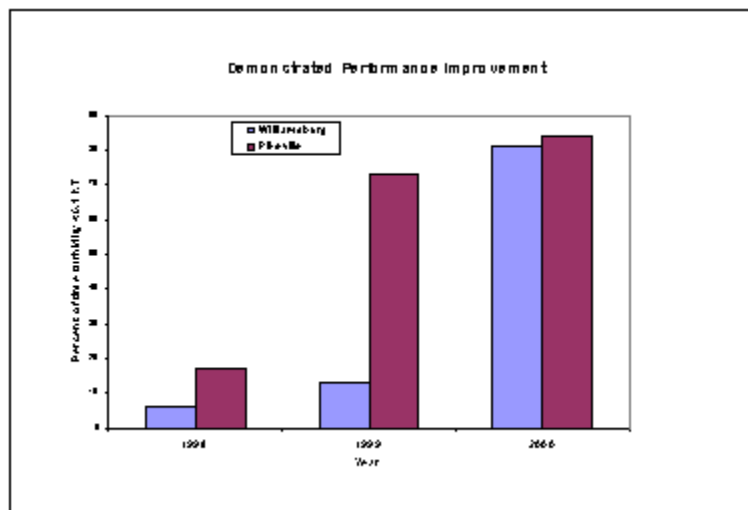


Figure 3.7

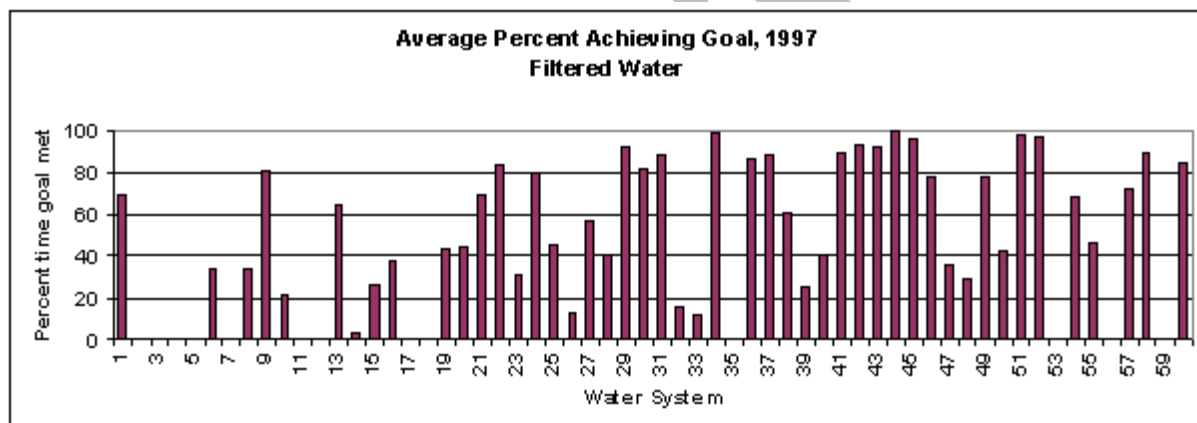


Figure 3.8

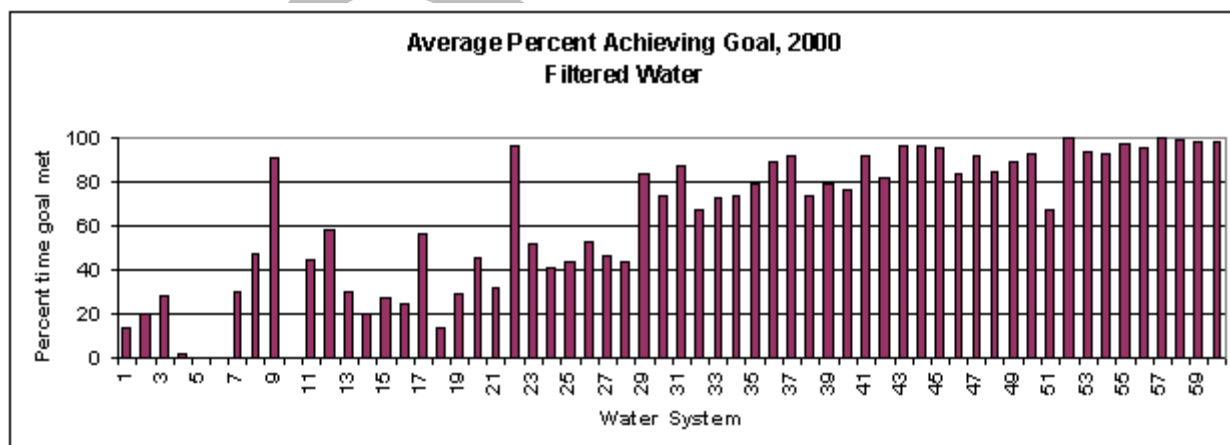


Figure 3.9

Those States that fully implement AWOP are able to demonstrate improved performance and enhanced public health protection at filtration plants State-wide. Figures 3.8 and 3.9 show the changes in the performance of all the filtration plants in the States over a four year period.

3.18.5 Potential use of AWOP in LT1ESWTR Implementation

Implementation activities for LT1ESWTR should recognize the resource limitations and related compliance burdens of small systems. Therefore, the AWOP can be an effective and efficient implementation tool to prioritize resources and reach the systems in most need.

A variety of LT1ESWTR implementation activities can be integrated into the status, targeted assistance, and maintenance activities of an AWOP. Some examples include the following:

Identify affected systems and their system-specific requirements

The status activities are designed to accomplish this activity. Information of various types can be included in a prioritization process to identify which systems need the greatest levels of assistance and help target the appropriate assistance to specific plants.

Communicate requirements to the affected systems

In the status activities the plants are informed of the performance goals, and each plant's performance relative to those goals on an ongoing basis. Ongoing communication of the public health implications of plant performance is also incorporated in formal and informal activities under the status and targeted assistance portions of an AWOP. They could also be made aware of the State's AWOP and the different targeted assistance they may receive.

Evaluate the adequacy of Watershed Control Programs for *Cryptosporidium*

Current models for status activities have provided more attention to plant performance over the adequacy of watershed control programs. However, an AWOP is flexible and States have the option of increasing the importance of this aspect of public health protection and including it in the prioritization matrix to identify those plants with problems related to watershed control.

Ensure training opportunities are available for systems to learn how to perform filter self-assessments and report results

Under AWOP all State training would be assessed as a maintenance activity. The effectiveness of the training provided to the plants could be assessed by evaluating those plants that receive training and any impacts on the plant's performance. Modifications to the training based on feedback from the targeted assistance activities could be used to improve all types of training provided to the plants.

Maintain a list of approved third-parties for conducting CPEs and/or develop and maintain State staff CPE expertise and availability

One of the major considerations, when developing an AWOP is what is the State's role in completing CPEs. Many States have chosen to do the CPEs in their States, but use of third-party providers is also an option. Third-party CPEs, however, may represent a special challenge to States in that the State staff will need a certain level of expertise to properly review third-party CPEs and certification issues with third-party CPE providers can be complicated.

Evaluate monthly filter performance reports for combined filter effluent and individual filtered water turbidity

The current model used by most States implementing an AWOP is to collect and enter daily maximum performance data for combined filter effluent and individual filtered water turbidity data on a monthly basis. These data are entered into spreadsheets used to evaluate performance and to share the results of the evaluation with the affected water systems.

Evaluate reports of filter self-assessments and determine if additional action is necessary

Implementation of an AWOP includes utilizing data collected through the application of optimization tools, such as filter self-assessments. The results of such activities are used to determine the appropriate level of State involvement to maximize public health protection.

Evaluate the results of CPEs and determine if additional action is necessary

Performance data collected during a CPE is continually monitored in an AWOP, allowing a State to determine on an ongoing basis if the performance goals are being met. When a CPE is conducted, and post-CPE performance is not sufficient to meet the goals, additional action may be necessary. Furthermore, the results of a CPE are incorporated and used through implementation of an AWOP, and provide guidance for any necessary additional actions to improve plant performance.

Track regulated system compliance progress and implement enforcement action as needed

The AWOP status activities directly address the above areas. The AWOP status activities will allow this valuable information to be effectively used to make sure that the plants receive their proper relative priority with respect to the other plants and that appropriate targeted assistance activities are used at the priority plants.